

# SILICON-BASED DIELECTRIC TUNNELING EMITTER

## ABSTRACT OF THE DISCLOSURE

*See Fig. 1*  
5 An emitter has an electron supply layer and a silicon-based dielectric layer formed on the electron supply layer. The silicon-based dielectric layer is preferably less than about 500 Angstroms. Optionally, an insulator layer is formed on the electron supply layer and has openings defined within in which the silicon-based dielectric layer is formed. A cathode layer  
10 is formed on the silicon-based dielectric layer to provide a surface for energy emissions of electrons and/or photons. Preferably, the emitter is subjected to an annealing process thereby increasing the supply of electrons tunneled from the electron supply layer to the cathode layer.

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